

# Don't take risks! – Skin protection in beauty institutes

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**Manual work, mechanical strain and the contact with various substances: if these characteristics are typical for your workplace, you are more likely to suffer from skin reactions and dermatoses. Protect yourself!**

**O**ccupational groups at risk are metal and construction workers, food processing employees, hair dressers, hospital staff and last but not least cosmeticians. As a matter of fact, not always the harmful but frequently the obviously harmless substances are causing trouble when working with them. The most important and valuable work tools of cosmeticians are the hands and that is why skin protection primarily concentrates on them. An effective skin protection plan is based on the assessment of the daily individual exposure:

- What substances come into contact with your hands every day?
- How long and how often are they exposed?
- Can the respective substances penetrate into the skin barrier?
- What effects result from these working substances?

The external protective shield of the epidermis, the horny layer (stratum corneum) consists of corneocytes. The intercellular lipid bilayers are composed of cholesterol, ceramides and long-chained fatty acids in a molecular ratio of 1:1:1. Stratum corneum disorders lead to an augmented transepidermal water loss (TEWL), dry skin, later on to rhagades and to toxic degenerative eczema in the long run. At the same time, the risk of irritative and allergic contact eczema but also infections will augment since the permeability of the skin barrier for substances and germs is increased. In some circumstances, additional factors join up and further boost the sensitivity of the skin, as for instance the disposition to atopic skin or also atrophy due to adverse effects of pharmaceutical drugs (e.g. corticoids).

## Prevent damages

Relationships can be rather complex in certain cases as the following examples will illustrate:

- Extended exposure to water can cause a swelling of the horny layer. The calcium salts contained in water (water hardness) react with the fatty acids of the skin barrier to form lime soaps that damage the skin barrier. The more extensive the pre-existing defect, the more significant is the damage. Since water is the most frequent medium in the beauty institute, water softening measures should take priority when it comes to preventing damages. Water hardness information can be obtained by the local water suppliers or via internet.
- Unless gloves are used, hand cleansings between the different treatments are an absolute must. During hand washing strong tensides penetrate into the barrier and solve fatty acids and cholesterol at first and subsequently the more resistant ceramides. Depending on the particular tenside this can also lead to irritations. It is therefore appropriate to use hand cleansers based on mild tensides as for instance alkyl polyglycosides (APG: sugar tensides). Frequently also a disinfection in the form of highly concentrated alcohols or isopropyl alcohol is part of the hand cleansing procedure. In this context the skin will also be degreased. Sparing use of these substances also is recommended and reduces strains induced by the plasticizer diethyl phthalate, due to the fact that in the majority of cases the less expensive denatured alcohol is used in the daily practice.
- The German Professional Association (BG) recommends applying hand cream after each cleansing. The aim is to quickly restore the damaged skin barrier and reduce the increased TEWL. Former concepts of the Professional Associations were based on a radical reduction of the TEWL towards zero in order to protect the skin on a preventive basis against working substances - frequently by using paraffins. In the course of time however, it became known that the natural regeneration of the skin also is reduced this way. That is the

reason why today less occlusive protective creams are used in order to restore the natural TEWL. Continual protection and hand care also is necessary during the time off work in order to benefit from the natural recovery potential of the skin. This way, the hands are optimally prepared for the following working day.

- Skin care and skin protective creams should preferably be free of emulsifiers in order to keep the potential wash-out effect associated with the substances as low as possible. The so-called washout effect means that physiologically non-degradable emulsifiers that penetrated into the skin with creaming will be activated after contact with water respectively skin cleansing. In this context, not only the previously applied lipid substances of the skin care preparations but also part of the natural barrier substances of the skin will be lost. In other words, the skin becomes worn out.
- Based on the washout effect and repeated creaming, cream additives that have no place in the skin are again and again infiltrated. Among these cream additives are preservatives that, without any exception, have allergenic potential which is the reason why they are listed in the annex of the Cosmetic Directive. Another group of additives are the allergenic components of perfumes; while some of them already have to be declared in the INCI, additional components are currently being discussed in this respect. Therefore preservatives and perfumes should a priori be avoided. Currently the preservative methylisothiazolinone which is widely used in leave-on preparations is in the process of being banned due to its high allergenic potential. Also new representatives such as the frequently publicized antibacterial micro silver should be regarded with due care. Micro silver can lead to skin discolorations (argyria). Further counterproductive substance families are phenolic antioxidants such as BHA (E 320) and BHT (E 321) as well as complexing agents (e.g. EDTA). Besides external heavy metals, EDTA also inactivates the heavy metals of the natural enzymes of the body.
- Often neglected but nevertheless everyday allergy triggers are the traces of nickel compounds from (fashion) jewellery, released and transported by the polyethylene glycols (PEG) used as emulsifiers, consistency agents or filming agents. PEGs belong to the non-degradable compounds with high washout potential.

### Convincing concept

The principles of your own skin protection and the composition of the preparations used for customer treatments should, of course, be compatible. If not, the above-mentioned negative effects will use the back door entrance, figuratively speaking. Meanwhile compounds with physiologically compatible or partly skin-identical components without counterproductive additives become more and more popular - an excellent basis for skin protection.

The regulations of the German Professional Associations provide a skin protection plan for every establishment with detailed explanations regarding the preparations for the skin protection before work, the cleansing measures while and after work as well as the skin care after work.

### Gloves

Despite of adequate preparations for skin protection and skin care, as far as practicable, gloves should be worn when working with nail enamel removers such as acetone or acetic ester („ethyl acetate“), highly concentrated alcohols or other solvents or disinfecting fluids. This also applies for room cleaning with low tenside concentrations or in other words, with water and a few splashes of detergent concentrate.

Gloves are disadvantageous insofar as the skin starts to sweat and swell below the occlusive cover, a fact that could lead to adverse reactions in the case of sensitive skin. Cotton undergloves can be beneficial in this case. A pre-treatment of the hands with astringent tannin-containing extracts (witch hazel, tannins) can facilitate the use of gloves.

### Legal requirements and recommendations

There are detailed legal regulations that you should observe, in particular as a small business employer and beauty institutes generally fall within this definition. In Germany, these regulations are summarized in the „Technical Rule for Hazardous Substances“, TRGS 401 „Skin contact hazards: diagnosis - assessment - measures“, edited by the Federal Ministry of Labour and Social Affairs (Bundesministerium für Arbeit und Soziales - BMAS). The last edition is dated June 2008 and can be downloaded free of charge from the website. The work in moist environment is extensively covered in TRGS 401. The regulation TRGS 531 „Work in moist environment“ was suspended in 2006, however is completely contained in TRGS 401. Besides the already mentioned additives, extended skin contact should

also be avoided with the following substances used in the institutes:

- Creams containing thioglycolic acid to be administered for hair removal purposes. They are allergens and usually have a high pH level.
- Lotions and creams for callus and corn removal. With their high pH levels they solve the fatty acids of the skin barrier. The same applies for alkaline preparations and baths.
- Acids with low pH level such as concentrated fruit acids (AHA) and the related chemical microdermabrasions including herb peelings cause irritations and even corrosive injury after extended skin contact.
- Enzyme peelings affect the keratin structure of the horny layer.

- Disinfectants such as hydrogen peroxide and bleaching lime (hypochlorite) bleach the skin immediately after skin contact.
- Chloroaromatic disinfectants and preservatives as for instance triclosan have a high allergenic potential.

Whenever it comes to barrier disorders despite of all preventive measures, individually adapted hand cream mixtures can be beneficial, as published in *Hand & nails* 2011;4:12-14. Vitamin creams can be recommended for the follow-up treatment of fungal infections. They accelerate the recovery of the skin and help prevent new infections.

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